



2.1 - MCBSE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, Washington 98101

May 8, 1995

MEMORANDUM

SUBJECT: McCormick & Baxter Superfund Site  
Review of Revised Feasibility Study

FROM: Allison Hiltner  
U. S. EPA Region 10 *Allison Hiltner*

TO: Bruce Gilles  
Oregon DEQ

I have attached EPA's comments on the April 1995 revised Feasibility Study for the McCormick and Baxter site prepared by PTI Environmental Services. EPA reviewers had a difficult time reviewing this document for several reasons. For example, the site conceptual model and information on which the cleanup areas have been delineated has not been clearly presented. The discussion of risks posed by the site is misleading and does not leave the reader with a clear understanding of what needs to be remediated and why. Many other examples could be provided. This document will require much revision before it can be considered acceptable.

I suggest we meet soon to discuss how to revise this document to provide an acceptable basis for EPA and DEQ's proposed plan for cleanup of this site.

I have also attached a number of guidances which will assist DEQ in understanding how RCRA regulations apply to CERCLA sites, especially Land Disposal Restrictions.

Please note that I have not yet received comments from some of the reviewers who are specifically focusing on Appendix C, so I will have some additional comments on Groundwater Restoration within the next few days.

Feel free to call me at (206) 553-2140 if you have any questions or would like to discuss EPA's comments.

Attachments



## EPA REVIEW OF MCCORMICK AND BAXTER REVISED FEASIBILITY STUDY

### GENERAL COMMENTS:

This document has numerous deficiencies which must be corrected before it can be considered final. EPA has several overall concerns about the document. These concerns affect the entire report, making it difficult to provide specific comments on various sections of the document. Therefore the bulk of our comments are presented as general issues.

The section that needs the most improvement is Section 3. This section should set the stage for the rest of the document by explaining what media and areas need cleanup and why. As it stands, this section does not provide sufficient information to support the proposed remedial options, and in fact, downplays site risks to such an extent that one wonders why the site is being remediated at all.

General comments are presented below, organized by major categories of concern.

### CONCEPTUAL MODEL

This Feasibility Study (FS) very much needs a section explaining the site conceptual model. Of particular concern is the fate and transport of contaminated groundwater and NAPL, and its migration to sediment.

Some of the issues which should be addressed in the conceptual model include:

- Are LNAPLs impacting the river? Late in the document there are discussions about remedial options reducing seeps to sediments, but there is never a statement that seeps are a source of sediment contamination.
- Are DNAPLs impacting sediments or are they migrating so far below the surface that they do not pose a threat? Do they threaten the lower aquifer?
- Are dissolved contaminants in groundwater impacting sediments or just NAPL?
- What are potential past and present sources to sediment contamination? Does most of the contamination seem to be historical or ongoing? What do we need to be sure is controlled before sediments are remediated to prevent sediment recontamination?
- Discuss the sources of soil contamination and the contribution of vadose zone and saturated zone soil contamination to groundwater contamination. (Summarize discussion from Appendix B.)

The site model directly impacts the extent of remediation and the types of remediation required at this site. Reaching a consensus on this matter is essential before agreement can be reached on an appropriate remediation plan for the site. It is understood that all aspects of contaminant fate and transport may not be fully understood given current site data. This should be discussed as well.

#### **IDENTIFICATION OF SITE RISKS**

The summary of the risk assessment should be expanded to more fully explain which contaminants and media pose a risk at the site. The summary tables in the risk assessment showing risk levels for each medium and indicator chemical should be reproduced in the FS. This should be followed up by a discussion of the major issues driving the clean-up at the site, e.g.: surface sediment is a problem because of contact risk and toxicity to benthic organisms; deeper sediments are not a problem because they are separated from the surface sediments by greater depth; surface soils are a problem due to contact risk; deeper soils are not a problem because they are not a contact risk; ground water is or is not a problem due to the dilution capacity of the river; and NAPLs are a problem only if these reach the surface sediment as product.

#### **REMEDIAL ACTION OBJECTIVES**

The discussion of remedial action objectives should include a narrative discussion of the remediation goal for each medium. For example, is the goal for NAPL remediation to minimize the mass of contaminants (by extracting as much NAPL as possible), prevent direct contact to humans, or to prevent migration to the river, or some combination of these?

**Groundwater RAOs:** An RAO on page 3-9 states "Prevent releases of contaminant from sediments that would result in surface water levels in excess of surface water criteria listed in Table 3-3." The FS goes on to state that these RAOs are not being exceeded, which leads the reader to question why remediation is necessary. The document should discuss whether or not, over time, groundwater contaminant concentrations at the river might be expected to increase to above the RAOs for protection of the river if groundwater is not remediated.

Section 3.2.5 appears to be saying that there is little or no problem associated with the dissolved phase groundwater contamination. However, the last paragraph states "Even though dissolved-phase groundwater contamination does not present a principle threat at the site, it may be a potential low-level long-term threat that will be considered further in this FS." No basis is provided for this statement. A basis for this statement

should be included and referenced or the statement on long-term threat should be removed. This could mislead the public and has a high potential for impacting the remedial action selected.

Soil RAOs: Section 3.1.1 states "---the soil-groundwater-surface water pathway does not currently result in exceedences of ambient water quality criteria in the river. An RAO has been included to address this pathway, however, to reduce the potential for contaminants in soil to leach into groundwater and cause exceedence of the ACLs." As noted for groundwater RAOs, the document needs to discuss whether there is a potential for RAOs to be exceeded in the future if left unabated, otherwise one has to questions whether it is appropriate to include an RAO to "minimize further contaminant migration from soil to groundwater, as appropriate, to meet calculated groundwater ACLs".

NAPL RAOs: Section 3.1.2. states "Remove or contain NAPL sources to the extent practicable to protect human health by preventing direct discharges to seeps along Willamette River beaches." The type of harm to human health or the environment created by the seeps is unclear. If the issue is contact, a cap could address the problem without removal. Or is the concern migration of contaminants to river sediments?

Another paragraph in Section 3.1.2 states "Remove mobile NAPL from the shallow fill aquifer and deeper alluvial aquifer to the extent practicable to prevent further migration or release to surface water and river sediments and reduce the available source mass that will provide a continuing source of dissolved groundwater contamination". This does not fit well with the description of the situation in other sections of this document. See previous comments regarding the site conceptual model and the Groundwater RAOs.

Section 3.1.2 also states "Protect aquatic biota by minimizing NAPL discharges to Willamette River sediments and surface water." The FS does not establish that toxicity to aquatic biota is linked with NAPL discharges.

#### PRINCIPAL THREATS

As evidenced by the above comments on RAOs, the principal threat portion of Section 3 is very misleading. There is so much justification of what is not a threat, one wonders why we are cleaning up the site at all. This section should be eliminated. It should be replaced by a general discussion of the threats posed by the site, to explain to the reader what the FS proposes to clean up and why.

There is also a lack of clarity where the document attempts to establish what is a principal threat. Section 3.2.7 states: "Mobile NAPL is a principal threat at the site." and "Mobile NAPL

seeps in sediment are a principal threat---". The FS does not provide a basis for these conclusions. The DNAPL appears to be migrating into material beneath the sediment and the LNAPL may be migrating into the water column from shoreline seeps. However, other sections of the document establish that contaminant concentrations are attenuated to below water quality criteria before reaching surface water. Threats associated with the mobile NAPL should be defined in detail or if there is little or no threat, the statement should be revised to reflect reality.

The principal threat section should be replaced by a much smaller section in Section 6 (nine criteria analysis) which discusses and justifies what is considered a principal threat, and whether or not the proposed alternatives will address the principal threats by treatment. It is not necessary to justify what is not a principal threat.

#### PRESENTATION OF SITE DATA

The report should have a summary early in the report (and maybe also in the Executive Summary), which highlights and discusses the site data used to develop the FS. Reviewers suggest a summary data table or matrix which fully identifies how much of what type of data was collected for each medium--such as X number of soil samples with laboratory analysis for this list of chemicals, Y number of samples with only visual "data", Z of field screening data, etc. It is difficult to read the report and sort out where there is real data to support the conclusions, and where there are assumptions and estimates used to reach the conclusions. The report should also discuss areas of uncertainty and where data gaps occur.

Reviewers found it difficult to follow the logic which shows the wells where DNAPLs have been detected (such as MW-20 in Figure B-5) are shown in the cross-sections as having relatively low concentrations of PAHs. It seems that where DNAPLs are found in monitoring wells that the characterization should indicate very heavy contamination at depth, if that is where the DNAPL is supposed to be pooled. It would help to have the DNAPL thickness in wells shown in some of the cross-sections. Based on the data presented in the cross-sections (such as B-5), it appears that much of the contamination (and therefore, the product ?) is at relatively shallow depths below the water table.

#### IDENTIFICATION OF REMEDIATION AREAS

In general, too little information is presented to allow the reader to compare the proposed remediation areas to the site data and draw their own conclusions as to whether the areas were appropriately drawn. It should be clear to the reader to what extent boundaries were drawn using visual observations, field screening data, laboratory data, inference, or other information.

**Sediment Remediation Areas:** The brief discussion on page 3-23 regarding how the sediment remediation area was developed is insufficient. It would be greatly enhanced by overlaying figure 3-7 with a map showing sample locations, with different symbols for stations exceeding each of the criteria discussed on pages 3-23 - 3-25, so the reader can understand how these criteria defined the cap.

EPA also suggests including Figure 5-18 (which shows the cap overlain by river bathymetry) in Section 3 to allow reviewers to evaluate the statement that the extent of the remediation area was selected to "create a geometry that was more feasible for capping". The map should also delineate the navigation channel.

**Soil Remediation Areas:** As discussed for the sediment remediation areas, Figure 3-4 should be overlain with sample locations and symbols showing where samples exceeded stated criteria. Of particular importance with the soil data is distinguishing between laboratory and field screening data, and where no information is collected, and the remediation area was drawn based on assumptions and inference.

The FS proposes the removal of 1 foot of contaminated soil from the site to remediate the broadly dispersed contaminants that are associated with a risk of contact. Other sections of the FS indicate the depth of the dispersed contamination is 1 to 2 feet. Therefore, it appears that removal of one foot of contaminated soil will not eliminate the risk in non-source areas of the site. If the goal is to clean some areas of the site sufficiently for non-restricted use be achieved if there is no assurance that some contaminants at depths of greater than 1 ft might be left behind? This proposal deserves more thought. Is a cleanup to some criterion more appropriate?

The assumption that a 4-foot depth will be sufficient for placement of utilities may not be true, depending on the future use scenario for the site. Utilities are frequently placed at depths greater than 4 feet. Also, the necessity of a shoring requirement or sloping walls below 4 ft depth is debatable if workers do not enter the excavation. Depending on the soil type present, shoring may not be required down to 15 ft bgs; however, sloping walls are generally needed. Avoiding sloping walls should not be the rationale for selecting a removal depth. This depth should also be tied into, or at least supported by, attenuation of contaminants at depth in the source areas.

**NAPL Remediation Areas:** Figure 3-5 does show monitoring well locations, but it is not clear how "residual NAPL" and "NAPL pools" were defined or determined.

In general, it is not clear how PTI is defining the term NAPL "pools", and "mobile NAPL" or whether NAPL pools actually

exist at the site. Pools commonly develop over less permeable layers of soils or over other obstructions. Much of this site is without such obstruction and may not develop pools. It is not clear whether the FS proposed to remove only "pooled" NAPL, or whether they are planning to remove NAPL wherever it is present at recoverable levels. The document states that only "mobile NAPL" has been recoverable to date. However, EPA suspects that DEQ may be able to extract a considerable amount of "residual NAPL" once full scale copumping of NAPL and groundwater is implemented. This has been the case at the Wycoff site. This technology should be considered at this site.

**Dissolved Phase Groundwater Contamination Areas:** Monitoring well locations should be included on Figure 3-6, and the document should define what is meant by the "contamination area". What contaminant concentrations were used to define these areas? Was it based on laboratory data, field screening data, or visual observations?

## REMEDIAL TECHNOLOGIES

**Solvent Extraction:** Section 4.1.5.6. states that solvent extraction is dismissed because it is not included as a presumptive remedy for wood treating and has not been listed as performed or proposed for wood preserving sites. This is not good rationale for not considering this technology. This section also states that "This type of treatment is most effective when soil contamination is high, as in sludges and source materials." This section appears to be in direct conflict with site information, as this site contains highly contaminated soils and sludges.

**In-situ Vitrification:** Section 4.1.5.4. discusses the use of vitrification and fails to retain this technology based upon the statement that "--technology is extremely costly and could render the site unusable for future development." The discussion on rendering the site unusable for future development deserves more explanation. This technology impacts future use of some areas of the site, but this will be the case for most of the technologies presented and should not be used as a major criteria to not retain this technology. Costs are certainly an issue.

**In-Situ Technologies:** Various types of in-situ bioremediation are discussed for vadose zone treatment and then dismissed. It is EPA's understanding that DEQ is interested in pursuing some in-situ treatment of soils (soil flushing) as part of the proposed remedial action. DEQ should check these discussions in the FS and replace rejection of these technologies with a discussion that says in-situ technologies require pilot testing, but might be worth pursuing as an adjunct to other site cleanup plans.

Table 4-1 indicates that in situ bioflushing is ineffective with NAPLs and generally slower than ex situ biotreatment. This is true, however, there may be other advantages that outweigh this phenomena, such as cost. The practicality of in situ treatment depends a great deal upon the particular site conditions. Also there are other types of in-situ technologies which are not discussed here.

It seems that if much of the contamination sources are likely to be left in the unsaturated zone, that some technology, like a combination of soil vapor extraction and bioventing, could be used in-situ to continue to reduce the mass of contaminants in place. This type of technology could deal with the large concentrations of LPAHs which could be either extracted or degraded with the addition of oxygen to the subsurface. While this technology would not remove the HPAHs, these are also less mobile, and the technology could be implemented together with the probable capping of the site surface soils for containment.

**Vertical Barriers:** EPA does not agree with the negative statements about the effectiveness of vertical barriers scattered throughout the document, and would like PTI to provide a more balanced discussion.

Reviewers found the discussion of physical containment (section 4.2.3.1.) too limited in that it was based only on barriers to full depth, the need to go down to a competent aquitard, and whether the computer model could model it. There should be some discussion about the efficiency gained from a pumping system if a "hanging wall" is considered to optimize the ground water and NAPL extraction systems. A hanging wall system should help direct the flowpath of the ground water entering the containment zone, and should help mobilize the potentially mobile DNAPLs towards the extraction wells.

It appears it would be possible to key a wall into the confining layer at the TFA. The FS should discuss the feasibility and effectiveness of this.

**NAPL Extraction:** It must be noted that in NAPL recovery systems, 50 percent recovery of free product is optimistic, depending on aquifer/subsurface characteristics. It appears that the aquifer material is not highly permeable. Under these conditions, free product recovery may be lower than estimated, perhaps about 30 percent.

Reviewers recognize that Figure 5-3 is a typical extraction well design; however, consideration should be given to details of the bottom of the well as it relates to DNAPL recovery (e.g., a blank casing trap).



Again, there needs to be clarification of the term NAPL "pools". From the discussion on page 5-62, it appears that PTI is equating NAPL pools with greater than 1 foot of NAPL in wells, as this is where they have had success with passive NAPL extraction. Is this true? The FS appears to limit alternatives involving copumping of water and NAPL to NAPL "pool" areas. It has been EPA's experience that substantial yields of NAPL can be obtained through copumping from wells which did not yield NAPL under more passive methods.

The groundwater remediation alternatives need to be discussed in the context of the remediation goal. There is currently only minimal discussion in the document of whether any or all of the alternatives (including the no action alternative) will achieve the ground water remediation goal of ACLs at the river's edge, and protection of the deeper aquifer. A cursory discussion of whether alternatives ACLs is provided in Section 6.4.2.2, however this should also be discussed in Section 5.

The NAPL found at the northwest corner of the site should be discussed somewhere in the FS. Wouldn't it be worthwhile to better delineate the extent of contamination here (in pre-design, perhaps) and determine whether it should be part of the cleanup or referred to another authority? What are DEQ's plans to address this portion of the site?

**Treatability Studies:** The description of soil remediation technologies should include a discussion of whether treatability studies are needed to determine whether the technologies will be effective on site soils. The document discusses the treatability studies performed by CH2MHill for McCormick and Baxter for land treatment, but no other treatability studies were mentioned. Were other treatability studies performed?

**Sediment Remediation:** The discussion of the effectiveness of a sand cap must be expanded upon. The FS should discuss whether capping will be adequately protective if a flooding event occurs. There should be a discussion of the predicted hydrologic events used to design the cap and the type of armoring necessary to protect the cap. Other potential disturbances to the cap, such as boat traffic, should also be discussed.

The alternative of natural attenuation is not described adequately. It would appear that some source control has occurred in that there seems to be a decrease in the occurrence of oily sheens on the river. There should be some evaluation of the potential for natural attenuation of sediment contamination. For example, was any sediment sampling done during the 1987 CH2MHill investigation that could be compared to the RI data? DEQ should also mention that the cap may accelerate natural attenuation of contamination in non-capped areas, as some of the

clean cap sediments are dispersed and mixed with nearby sediments.

The FS should discuss the issue of postponing capping until source control has been achieved. The proposal of adding more and more layers if recontamination occurs does not seem like the most practical or cost-effective option. A sampling plan for determining when source control is adequate should be developed, and capping should occur only after DEQ has determined that sources have been adequately controlled.

#### FUTURE USE

The future use of this site may require the placement of construction fill, that would also serve to prevent contact. This could be a low cost or no cost alternative if performed in conjunction with development of the property. In addition, knowledge as to where utility corridors are need and to what depth will aid in guiding removal of deeper contaminated soils. This option should be developed and discussed. However, timing would have to be such that the abatement of human health threats is not delayed due to uncertainty as to future use.

#### NINE CRITERIA ANALYSIS

DEQ needs to review this section carefully to be sure that a reader will be able to use this analysis to understand why DEQ chose the proposed remedy.

EPA and DEQ should discuss whether Figures 6-1, 6-3 and 6-4 are effective in conveying information or if they simplify information so much as to make it misleading. In any event, these figures need to be carefully reviewed to make sure they reflect EPA and DEQ's views.

**Reduction in TMV:** The discussion of the reduction of toxicity, mobility, or volume (TMV) through treatment criterion is almost correct. PTI is correct in stating that it is appropriate to discuss whether alternatives achieve reduction in TMV through containment, however an alternative is said to have met this criterion only if it is achieved through treatment. This should be clarified on page 6-3, and corrected on alternative evaluation figures.

**State and Community Acceptance:** EPA suggests deleting discussion of State and community acceptance in Section 6, and just saying that the community acceptance criterion will be evaluated based on public comments and discussed in the ROD. Since this is the State's document, it seems strange to discuss "state acceptance".

Summary: EPA and DEQ should discuss whether it is appropriate to have a summary and ratings of alternatives, especially since the most highly rated combinations of alternatives do not match up with DEQ's preferred alternative. It might be best to leave this type of discussion to the proposed plan.

#### ARARs:

The discussion of ARARs in Section 6 and in Appendix F is extremely cursory and incomplete. At a minimum, Section 6 should discuss what laws or regulations would be ARARs for a particular alternative, and whether the alternative would meet them. Appendix F should provide a summary of what actions are required or limits are imposed under the listed ARARs. Several other ARARs must be discussed, for example, Clean Air Act regulations, Floodplains/Wetlands policies and regulations, Safe Drinking Water Act regulations, and State/Federal Water Quality Standards.

Also, every section in Appendix F should make a clear distinction as to whether the regulatory requirement being discussed applies to on-site or only off-site actions. This is especially true when permits are being discussed. Permits are only needed for off-site actions.

RCRA: The discussion of RCRA ARARs in Appendix F needs further development. For example, it is stated on page F-4 that contaminated media may be considered listed wastes. This determination should be made by DEQ, with concurrence by EPA, and stated in the report. It should also state whether contaminated media are (or are likely to be) RCRA characteristic waste. If it is unknown, state what assumption is being made for the purposes of the FS. The report must also state whether the wastes in question are subject to Land Disposal Restrictions. These determinations should be discussed separately for each medium likely to be remediated.

The report is correct in stating that if wastes are considered to be subject to LDRs, the two options to allow treatment without triggering LDRs are designation of a Corrective Action Management Unit (CAMU), restricting treatment of waste to within the area of contamination (AOC). If LDRs are triggered, a RCRA treatability variance may be appropriate. (However, DEQ should consult the attached LDR guide on treatability variances to see if the proposed technologies can meet the treatability variance standards.) In deciding which option is appropriate, DEQ should keep in mind that the CAMU regulation is currently subject to a court challenge. Other options should be pursued if possible.

Another issue which must be addressed is whether RCRA minimum technology requirements for landfill closure are

applicable, or relevant and appropriate, to the remedial alternatives. It appears the unstated assumption is that it is not, since this is not discussed in the report. DEQ should present their rationale for this for review. If it is determined that RCRA minimum technology requirements are an ARAR, but that a soil cap is equally protective, an ARAR waiver will be needed.

DEQ should keep in mind that many of the options discussed above and in the Feasibility Study, such as an ARAR waiver or a RCRA treatability variance, require public review and comment, so they must be discussed in the proposed plan. Some of the applicable EPA guidances on RCRA LDR determinations are attached.

CWA: In the discussion of Clean Water Act ARARs on page F-7, it should be stated that a CWA Section 404 permit would not be required for dredging or filling required for the sediment cap, but substantive requirements would have to be met.

#### SPECIFIC COMMENTS

The specific comments listed below are by no means a comprehensive list of the specific items to be addressed when revising the document, but are intended to give DEQ some assistance in their own, more detailed, review.

Page ES-9 (Table ES-1): What does "test characteristic of lethality" mean? Was a certain % mortality used?

Page ES-13 (Table ES-5): Footnote c - first sentence - occupational use should be recreational use. What about an ecologically based remediation goal?

Page ES-16 (Figure ES-4): The legend should explain the difference between "extent of NAPL" and "limit of residual NAPL". See general comments about presentation of data.

Page ES-17 (Figure ES-5): How is dissolved phase groundwater contamination defined?

Pages ES-20-22 (Figures ES-7-9, and 6-1, 3, and 4): The reduction of toxicity, mobility, or volume criterion should read reduction of toxicity, mobility, or volume through treatment. None of the non-treatment alternatives attain this criterion. The figures should be modified accordingly.

Page ES-20 (Figure ES-7): Why does capping meet ARARs, but other alternatives which include capping "meet criterion, with some stipulations"? In general, there are several problems with these figures which require detailed review.

Page 1-1, 4th paragraph: Revise the last two sentences as follows: "Subsequent to this revised FS report DEQ and EPA will

develop a proposed plan and will solicit public comments on the proposed remedy for the site. The selected remedy and the basis for its selection including consideration of public comments, will be documented in a Record of Decision."

Page 1-3, third full paragraph: The site was added to the NPL on May 31, 1994.

Page 1-4: Typo - "PBC" should be "TBC".

Table 1-1: Typos -  $10^{-8}$  should be  $10^{-6}$ . Toxicity, mobility and volume should be toxicity, mobility or volume.

Page 1-6: The fourth sentence of the first full paragraph should be modified to read: "The NCP requires, however, that each remedial action selected be cost-effective provided it is also protective of human health and the environment and complies with ARARs . . ."

The last sentence of the first full paragraph should read . . . "selected remedy comply with ARARs or meet the criteria for one of the six ARAR waivers specified in 40 CFR 300.430 (f) (1) (ii) (C)."

Figure 2-1: Suggest identifying the outfalls by number.

Page 2-23: It is difficult to determine if the visual data presented on sediments is from a visual inspection of the surface of the sediment or a visual inspection of sediment cores.

Pages 2-25 and 2-28: Page 2-25 states that DNAPL is present in sediments to depths of 90 feet below the mud line Page 2-28 says NAPL is present up to 80 feet below the mud line. This is inconsistent with the statement on page ES-5 that sediments are contaminated at depths up to 35 feet below the sediment surface.

Page 2-28: There seems to be some confusion in this document on the existence of seeps at this time. One area says LNAPL is in seeps at both plume areas and page 2-28 says seeps have stopped in the TFA after the trench was installed. The document should be consistent.

Page 2-37: First full paragraph, end of last sentence, FWDA should be TFA.

Page 2-40 This section is unclear on what areas identified on page 2-27, other than TFA and FWDA, are contaminated deeper than 1-2 feet, requiring remediation.

Page 2-53: What were contaminant concentrations in MW-23? Were they above drinking water standards?

Page 2-69: Minor point, but the RI states that communities of clams are present in contaminated areas of the sediments, whereas the FS states that these communities are "thriving". Was additional study done to determine that these communities are "thriving"? Suggest deleting this term.

Page 3-2, Table 3-1: Provide a footnote citing the reference for the  $1 \times 10^{-3}$  -  $1 \times 10^{-1}$  TCDD and TCDF cleanup level.

Page 3-9, Second bullet: Is background the appropriate RAO for the deep aquifer? Perhaps it should be set at MCLs and target risk levels?

Page 3-18: What does the statement "the volume of groundwater flushing beneath the contaminated vadose zone intervals is 3-4 times the volume flushing from the vadose zone" mean?

Page 3-18: This dividing of vadose zone and surface soils at 4 feet seems very artificial. Is there any other way we can say what's in the last paragraph?

Page 3-19, first paragraph, third sentence: Delete "principal".

Page 3-19 - 3-22: The groundwater section is not appropriate. This section does not explain why it is not a principal threat - it explains why ACLs are the appropriate cleanup level.

Page 4-6: Soil washing since fines will be subject to another treatment, it is also relevant to mention the expected % volume reduction.

Page 4-12, Thermal Desorption: Mention this technology's effectiveness with TCDD, TCDF.

Page 4-16: State that single well pumping and dual pumping are retained for further consideration.

Page 4-24: DEQ should note that the packed bed bioreactor has proven ineffective at treating contaminated groundwater at the Wyckoff site and has been removed from the treatment train.

Page 5-6, Table 5-1: Under air monitoring during construction, the document should also mention monitoring volatilization of contaminants during excavation or mixing of soils.

Page 6-5: DEQ and EPA should discuss whether we agree with PTI's proposed criteria for the success of treatment. DEQ should make a recommendation as to criteria for the success of treatment, including a discussion of whether LDRs are ARARs, and how they propose to approach this if they are.

Page 6-10: Does DEQ agree with the statement "it cannot be determined at this time whether stabilization of the arsenic-contaminated soil at the McCormick and Baxter site should provide any additional protectiveness of human health"? This is not EPA's position. Besides, isn't the solidified material to be buried under the cap, thus further decreasing the risk of human contact?

Page 6-23, Section 6.4.1.1: Why is reduction of risk due to metals not discussed?

Page 6-32: Does DEQ agree that alternatives GW-3 and GW-4 are equal in terms of long term effectiveness and permanence, and that "A contaminant transport evaluation has shown that extraction of groundwater in addition to extraction of NAPL would not provide any major additional long-term benefits to groundwater quality"? This does not provide much support for DEQ's preferred remedy.

#### Appendix B

Figure B-1 is titled "---existing pools". However, pools are not shown. See general comments regarding the definition of pools.

Table B-3 and Page B-4. The calculation of % void space saturated did not appear to use the maximum concentration. Why? Wouldn't this provide a different conclusion?

#### Appendix C

Page C-18 advises against the use of a cutoff wall for the FWDA plume. Couldn't a cutoff wall help cut off the flow of NAPL to the river if the contaminants are floating LNAPL?

Appendix C does not identify any means to control potential human exposure to groundwater beyond the facility boundary and the surface water source into which the groundwater empties. As stated in CERCLA § 121(d)(2)(B)(III), the remedial action should include enforceable measures to preclude human exposure to the contaminated groundwater at any point between the facility boundary and all known and projected points of entry of such groundwater into surface water. Appendix C should identify any such enforceable measures that would otherwise preclude use of groundwater as source of drinking water now or in the future.

Although groundwater beneath the area between the facility and the Willamette River may not have historically been used as a source of drinking water (pages C-2 and C-3), it is possible that it may be used as such a source in the future. Groundwater is currently used for municipal and agricultural uses in areas near the facility (page C-7), therefore, enforceable measures would appear to be required. Enforceable measures could include

prohibitions against drilling groundwater wells, local land use prohibitions, deed notifications, or deed restrictions.

#### Appendix F

Page F-2: Strike " . . . health-risk- or ecological-risk-based . . ." from the second sentence of first paragraph under "Types of ARARs". This is not necessarily true.

Page F-3: In the last paragraph, CAMUS are not ARARs. They provide an option for dealing with Land Disposal Restrictions, which could be an ARAR, depending on how waste is handled.

Page F-4: In the second paragraph, third sentence from the end, modify the sentence as follows: " . . . (AOC) (which is considered comparable to a land-based RCRA unit) . . . "

Page F-4: In the second paragraph, second to last sentence, the statement made here is not entirely true. With a CAMU, site specific standards are set, which can include MTRs and LDRs.

Page F-4: In the third paragraph, it should be noted that most of the 40 CFR Part 262 requirements are not considered substantive.

Page F-5: In the first paragraph, note that 40 CFR Part 263 requirements are not an ARAR for on-site actions.

Page F-5, F-6: Delete the last paragraph on page F-5 (and the first on F-6). RCRA Subpart S regulations are not an ARAR for CERCLA cleanups.

Page F-6, third bullet: Note that obtaining a treatability variance is not a regulatory mechanism that may not trigger LDRs. It is a way of complying with LDRs.

Page F-6, LDRs: The discussion reads as if LDRs only apply to soils. LDRs and other RCRA regulations are ARARs for other contaminated media as well.

Page F-7, second paragraph: The State issues CWA Section 401 certifications, not the U. S. Army Corps of Engineers.

Table F-1: Delete CERCLA from this table. CERCLA is not an ARAR, it is the basis for the cleanup.

Table F-1, first entry on Page F-10, Modify the third column to read "May be used to regulate corrective action . . . "

Table F-1, second, third, and fourth entries on page F-10: where the term post-closure is used, modify to read closure and post-closure . . . "



**Appendix G**

Page G-1: DEQ has mentioned low yield as another reason why the aquifer should not be considered a drinking water source. Should this be added to the bullets on this page?